

SPECIFICATIONS

PIPE BURSTING SANITARY SEWER – METHOD 2

PART 1 – GENERAL

1.1 SCOPE

- A. The work under this Section includes the pipe bursting of existing sewers throughout the service area.
- B. This section covers pipe bursting of existing pipe while simultaneously installing a new polyethylene pipe of the same size or larger size pipe where the old pipe existed, then reconnect existing sewer service house connections.
- C. All ancillary work shall be constructed properly in accordance with the Drawings and Specifications. All defects shall be remedied to the engineer's satisfaction prior to approval.

1.2 CODES, AND STANDARDS

- A. The contractor shall ensure that the products and work comply with the current version of the applicable American Society for Testing and Materials (ASTM) standards.

1.3 QUALIFICATIONS

- A. The contractor shall be fully experienced in installing HDPE via pipe bursting methods. The pipe bursting equipment and method of installation shall be the Grundocrack System as manufactured by T.T. Technologies, Inc.; the InneReam Pipeline Replacement System by Nowak Pipe Reaming, Inc.; or approved equal. **The contractor shall have a minimum pipe bursting experience of 5,000 linear feet.**
- B. The contractor performing the work shall be fully qualified, experienced, and equipped to complete this work expeditiously and in a satisfactory manner and shall be an approved installer as certified and licensed by the product manufacturer. **The contractor shall have a minimum of 40 documented hours of training from manufacturer.**

1.4 SUBMITTALS

- A. The contractor shall submit complete shop drawings and manufacturer's technical data showing complete information on material composition, physical properties, and dimensions of new pipe and fittings. Include manufacturer's recommendations for handling, storage, and repair of pipe and fittings damaged.
- B. Method of construction and restoration of existing sewer service connections. This shall include detail drawings and written descriptions of the entire construction procedure to install pipe, bypass sewage flow and reconnection of sewer service connections.
- C. Certification of workmen training for installing pipe by pipe manufacturer.

- D. The contractor shall submit a plan for bypassing sewage around the work area and facilities where sewage flows must be interrupted to complete the work. The plan shall be reviewed by the engineer and shall be acknowledged as acceptable before any work is started.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Replacement pipe installed by pipe bursting shall be high density polyethylene (HDPE) pipe. The pipe shall be manufactured from a high density, high molecular weight polyethylene resin which conforms to ASTM D1248 and meets the requirements for Type III, Class A, Grade P34, Category 5, and has a Plastic Pipe Institute (PPI) rating of PE 3408 when compounded. The pipe produced shall have a minimum cell classification of 345434D or 345434E under ASTM D3350.
- B. The HDPE installed under this contract shall be a minimum DIPS SDR 17 and shall be capable of supporting the full-bearing load. Contractor shall submit thickness calculations. Sections of HDPE shall be butt-fused in accordance with the HDPE manufacturer's specifications.

PART 3 – EXECUTION

3.1 DELIVERY, STORAGE, AND SHIPPING

- A. Transport, handle and store pipe and fittings as recommended by manufacturer. If new pipe and fittings become damaged before or during installation, it shall be repaired by the manufacturer or replaced at the contractor's expense, before proceeding further.

3.2 INSTALLATION

A. GENERAL

- a. The contractor shall perform the pipe bursting in strict accordance with the equipment and HDPE manufacturer's specifications and recommendations. The contractor shall locate all utilities in the area prior to performing the pipe bursting and shall be responsible for all restoration and damage caused by the installation, including upheaval of the ground and damage to adjacent utilities. **The contractor shall locate all existing sewer services by video or ground penetrating radar prior to any pipe bursting.**
- b. For sewer main replacement, the contractor shall disconnect existing service laterals from the main sewer prior to pipe bursting to prevent excessive damage to the lateral. After the bursting is complete, the contractor shall connect all active service laterals to the HDPE with a Romac CB Saddle or approved equal, to within five feet of new main. Refer to the Drawings/Details for any additional requirements.

B. CONSTRUCTION METHOD

- a. Equipment used to perform the work shall be located away from buildings so as not to create noise impact. Provide a silent engine compartment with the winch to reduce machine noise as required to meet local requirements.
- b. The contractor shall install all pulleys, rollers, bumpers, alignment control devices and other equipment required to protect existing manholes, and to protect the pipe from damage during

installation. Lubrication may be used as recommended by the manufacturer. Under no circumstances shall the pipe be stressed beyond its elastic limit. Winch line shall be centered in pipe to be burst with adjustable boom.

- c. The installed pipe shall be allowed the manufacturer's recommended amount of time, but not less than four (4) hours, for cooling and relaxation due to tensile stressing prior to any reconnection of service lines, sealing of the annulus or backfilling of the insertion pit. Sufficient excess length of new pipe, but not less than four inches, shall be allowed to protrude into the manhole to provide for occurrence. Installation of Electrofusion couplings shall be done in accordance with the manufacturer's recommended procedures.
- d. Following the relaxation period, the annular space may be sealed. Sealing shall be made with material approved by the Engineer and shall extend a minimum of eight inches into the manhole wall in such a manner as to form a smooth, uniform, watertight joint or within five feet of manhole. The terminating pipe ends in manholes shall be connected by Central Plastics Electrofusion couplings, Mission Style Couplings, or approved equal, to eliminate ground water infiltration. Installations of Electrofusion couplings shall be done in accordance with the manufacturer's recommended procedures.

C. PIPE JOINING

- a. The polyethylene pipe shall be assembled and joined at the site using the butt-fusion method to provide a leak proof joint. Threaded or solvent-cement joints and connections are not permitted. All equipment and procedures used shall be used in strict compliance with the manufacturer's recommendations. Fusing shall be accomplished by personnel certified as fusion technicians by a manufacture of polyethylene pipe and/or fusing equipment.
- b. The butt-fused joint shall be true alignment and shall have uniform roll-back beads resulting from the use of proper temperature and pressure. The joint shall be allowed adequate cooling time before removal of pressure. The fused joint shall be watertight and shall have tensile strength equal to that of the pipe. All joints shall be subject to acceptance prior to insertion. All defective joints shall be cut out and replaced at no cost. Any section of the pipe with a gash, blister, abrasion, nick, scar, or other deleterious fault greater in depth than ten percent of the wall thickness, shall not be used and must be removed from the site. However, a defective area of the pipe may be cut out and the joint fused in accordance with the procedures stated above. In addition, any section of pipe having other defects such as concentrated ridges, discoloration, excessive spot roughness, pitting, variable wall thickness or any other defect of manufacturing or handling shall be discarded and not used.

D. TESTS

- a. Tests for compliance with this specification shall be made as specific herein and in accordance with the applicable ASTM specification. A certificate with this specification shall be furnished, upon request, by the manufacturer for all material furnished under this specification. Polyethylene plastic pipe and fittings may be rejected in accordance with the requirements of this specification.

E. EQUIPMENT

- a. The pipe bursting tool shall be designed and manufactured to force its way through existing pipe material by fragmenting the pipe and compressing the old pipe sections into the surrounding soil

as it progresses. The bursting unit shall generate sufficient force to burst and compact the existing pipeline. The bursting shall be selected in accordance with the manufacturer's recommendations to meet the project specific requirements for the type and size of pipe being burst and upsized if specified.

- b. The pipe bursting tool shall be pulled through the sewer by a winch located at the upstream manhole. The bursting unit shall pull the polyethylene pipe with it as it moves forward. The tool shall be capable of being set into reverse, unlocked from the burst head, and backed out of the manhole through the new pipe to the entry point.
- c. The action of the pipe bursting tool shall increase the external dimensions sufficiently, causing breakage of the pipe at the same time expanding the surrounding ground. This action shall not only break the pipe but also create the void into which the burster can be winched enabling forward progress. At the same time the polyethylene pipe, directly attached to the bursting head, shall also move forward.
- d. The burster shall provide its own forward momentum while being assisted by winching. A hydrostatic winch shall give the burster friction by which it can be moved forward. To form a complete operating system, the burster must be matched to a constant tension hydrostatic winching system.

F. WINCH UNIT

- a. A winch shall be attached to the front of the bursting unit. The winch shall provide a constant tension to the burster in order that it may operate in an efficient manner. The winch shall ensure directional stability in keeping the unit on line and grade.
- b. The winch shall be hydrostatically operated and automatically provide a constant tension throughout the operation. The winch shall be of the constant tension type and shall be fitted with a direct reading load gauge to measure the winching load.
- c. The constant tension winch shall supply sufficient cable in one continuous length so that the pull may be continuous between approved winching points.
- d. The winch cable and cable drum must be provided with safety cage and supports so that it may be operated safely without injury to persons or property.
- e. The contractor shall provide a system of guide pulleys and bracing at each manhole to minimize cable contact with the existing sewer between manholes.
- f. The supports to the trench shoring in the insertion pit shall remain completely separate from the winch boom support system and shall be so designed that neither the pipe nor the winch cable shall be in contact with them.

G. SEWER SERVICE CONNECTIONS

- a. All sewer service connections shall be identified and located by video or ground penetrating radar prior to the pipe insertion to expedite reconnection. Upon commencement, pipe insertion shall be continuous and without interruption from one manhole to another.

- b. Connection of the new service lateral to the mainline shall be accomplished by means of a compression-fit service connection. The service connection shall be specifically designed for connection to the sewer main being installed, and shall be Romac CB Saddle as manufactured by Romac Industries, Inc. or approved equal. Install using procedures and equipment as referenced in manufacturer's written installation instructions.

3.3 ACCEPTANCE TESTS

- a. After the existing sewer is completely replaced, the new lines and/or manholes will be inspected by the Owner/Engineer. If any part of the project is unsatisfactory, the Owner/Engineer reserves the right to have any new lines videoed for inspection at the contractor's expense.
- b. Defects which may affect the integrity or strength of the pipe shall be repaired or the pipe replaced at the contractor's expense.
- c. All new manholes shall be vacuum tested in accordance with ASTM C1244. Vacuum tests shall be acceptable to the Owner/Engineer prior to project completion.